CLAIMS

1. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and a compound of the formula X_1-His-Lys-X-Lys-X_2 wherein

X is any amino acid,
X_1 is from zero to twelve amino acids, and
X_2 is from zero to twelve amino acids,
and wherein said compound optionally comprises an amino-terminal and/or carboxy-terminal protecting group.

2. The composition of claim 1 wherein

X_1 is from zero to six amino acids, and
X_2 is from zero to six amino acids.

3. The composition of claim 1 wherein X is selected from the group consisting of Ala, Leu, Ile, Val, Pro, Phe, Trp, Met, Ser, Thr, Tyr, Asn, Gln, Cys, and Gly.

4. The composition of claim 3 wherein X is Asn, Phe or His.

5. The composition of claim 1 wherein

X_1 is

(i) zero amino acids, or
(ii) the segment His-Gly-His-Glu-Gln-Gln-His-

Gly-Leu-Gly-His-Gly (SEQ ID NO:1) , or N-terminal truncation fragment thereof containing at least one amino acid, and

X_2 is

(i) zero amino acids, or

(ii) the segment Leu-Asp-Asp-Asp-Leu-Glu-His-Gln-Gly-Gly-His-Val (SEQ ID NO:2) , or C-terminal truncation fragment thereof containing at least one amino acid.

6. The composition of claim 5 wherein X is Asn, Phe or His.

7. The composition of claim 1 wherein the compound has substantial amino acid sequence homology to the amino acid sequence His-Gly-His-Glu-Gln-Gln-His-Gly-Leu-Gly-His-Gly-His-Lys-Phe-Lys-Leu-Asp-Asp-Asp-Leu-Glu-His-Gln-Gly-Gly-His-Val (SEQ ID NO:5) .

8. The composition of claim 1 wherein the compound has the amino acid sequence His-Gly-His-Glu-Gln-Gln-His-Gly-Leu-Gly-His-Gly-His-Lys-Phe-Lys-Leu-Asp-Asp-Asp-Leu-Glu-His-Gln-Gly-Gly-His-Val (SEQ ID NO:5).

9. The composition of claim 1 wherein the compound has the amino acid sequence Gly-His-Lys-Phe-Lys-Leu-Asp-Asp-Asp-Leu-Glu-His-Gln-Gly-Gly-His(SEQ ID NO:7) .

10. The composition of claim 1 wherein

X_1 is

(i) zero amino acids, or

(ii) the segment Gly-His-Lys-His-Lys-His-Gly-His-Gly-His-Gly-Lys (SEQ ID NO:3) or N-terminal

truncation fragment thereof containing at least one amino acid, and

X_2 is

(i) zero amino acids, or

(ii) the segment Gly-Lys-Lys-Asn-Gly-Lys-His-Asn-Gly-Trp-Lys-Thr (SEQ ID NO:4) or C-terminal truncation fragment thereof containing at least one amino acid.

11. The composition of claim 10 wherein X is Asn, Phe or His.

12. The composition of claim 10 having substantial amino acid sequence homology to the amino acid sequence Gly-His-Lys-His-Lys-His-Gly-His-Gly-His-Gly-Lys-His-Lys-Asn-Lys-Gly-Lys-Lys-Asn-Gly-Lys-His-Asn-Gly-Trp-Lys-Thr (SEQ ID NO:6) .

13. The composition of claim 10 having the amino acid sequence Gly-His-Lys-His-Lys-His-Gly-His-Gly-His-Gly-Lys-His-Lys-Asn-Lys-Gly-Lys-Lys-Asn-Gly-Lys-His-Asn-Gly-Trp-Lys-Thr (SEQ ID NO:6).

14. The composition of claim 10 having the amino acid sequence Lys-His-Gly-His-Gly-His-Gly-Lys-His-Lys-Asn-Lys-Gly-Lys-Lys-Asn (SEQ ID NO:8) .

15. The composition of claim 10 having the amino acid sequence His-Lys-Asn-Lys-Gly-Lys-Lys-Asn-Gly-Lys-His-Asn-Gly-Trp-Lys-Thr (SEQ ID NO:9).

16. A method of inhibiting angiogenesis comprising administering to a mammal an effective amount of a composition according to claim 1.

17. A method of inhibiting endothelial cell proliferation comprising administering to a mammal an effective amount of a composition according to claim 1.

18. A method of inducing endothelial cell apoptosis comprising administering to a mammal an effective amount of a composition according to claim 1.

19. A method of inhibiting angiogenesis comprising administering to a mammal an effective amount of two-chain high molecular weight kininogen.

20. A method of inhibiting endothelial cell proliferation comprising administering to a mammal an effective amount of two-chain high molecular weight kininogen.

21. A method of inducing endothelial cell apoptosis comprising administering to a mammal an effective amount of two-chain high molecular weight kininogen.

22. A method of inhibiting angiogenesis comprising administering to a mammal an effective amount of single-chain high molecular weight kininogen.

23. A method of inhibiting endothelial cell proliferation comprising contacting endothelial cells with a compound of the formula X_1-His-Lys-X-Lys-X_2 wherein

X is any amino acid,
X_1 is from zero to twelve amino acids, and
X_2 is from zero to twelve amino acids,

and wherein said compound optionally comprises an amino-terminal and/or carboxy-terminal protecting group.

24. The method of any of claim 23 wherein

X_1 is from zero to six amino acids, and
X_2 is from zero to six amino acids.

25. The method of claim 23 wherein X is selected from the group consisting of Ala, Leu, Ile, Val, Pro, Phe, Trp, Met, Ser, Thr, Tyr, Asn, Gln, Cys, and Gly.

26. The method of claim 25 wherein X is Asn, Phe or His.

27. The method of claim 23 wherein

X_1 is

(i) zero amino acids, or

(ii) the segment His-Gly-His-Glu-Gln-Gln-His-Gly-Leu-Gly-His-Gly (SEQ ID NO:1), or N-terminal truncation fragment thereof containing at least one amino acid, and

X_2 is

(i) zero amino acids, or

(ii) the segment Leu-Asp-Asp-Asp-Leu-Glu-His-Gln-Gly-Gly-His-Val (SEQ ID NO:2), or C-terminal truncation fragment thereof containing at least one amino acid.

28. The method of claim 23 wherein

X_1 is

(i) zero amino acids, or

(ii) the segment Gly-His-Lys-His-Lys-His-Gly-His-Gly-His-Gly-Lys (SEQ ID NO:3) or N-terminal truncation fragment thereof containing at least one amino acid, and

X_2 is

(i) zero amino acids, or

(ii) the segment Gly-Lys-Lys-Asn-Gly-Lys-His-Asn-Gly-Trp-Lys-Thr (SEQ ID NO:4) or C-terminal truncation fragment thereof containing at least one amino acid.

29. The method according to claim 27 wherein inhibition of proliferation includes apoptosis of the endothelial cells.

30. A compound of the formula X_1-His-Lys-X-Lys-X_2 wherein

X_1 is

the segment His-Gly-His-Glu-Gln-Gln-His-Gly-Leu-Gly-His-Gly (SEQ ID NO:1) , or N-terminal truncation fragment thereof containing at least one amino acid, and

X_2 is

(i) zero amino acids, or

(ii) the segment Leu-Asp-Asp-Asp-Leu-Glu-His-Gln-Gly-Gly-His-Val (SEQ ID NO:2), or C-terminal truncation fragment thereof containing at least one amino acid,

and wherein said compound optionally comprises an amino-terminal and/or carboxy-terminal protecting group.

31. The compound of claim 30 wherein X is Asn, Phe or His.

32. The compound of claim 30 having substantial amino acid sequence homology to the amino acid sequence His-Gly-His-Glu-Gln-Gln-His-Gly-Leu-Gly-His-Gly-His-Lys-Phe-Lys-Leu-Asp-Asp-Asp-Leu-Glu-His-Gln-Gly-Gly-His-Val (SEQ ID NO:5).

33. The compound of claim 30 having the amino acid sequence Gly-His-Lys-Phe-Lys-Leu-Asp-Asp-Asp-Leu-Glu-His-Gln-Gly-Gly-His (SEQ ID NO:7).

34. The compound having the amino acid sequence Lys-His-Gly-His-Gly-His-Gly-Lys-His-Lys-Asn-Lys-Gly-Lys-Lys-Asn (SEQ ID NO:8).

35. The compound having the amino acid sequence His-Lys-Asn-Lys-Gly-Lys-Lys-Asn-Gly-Lys-His-Asn-Gly-Trp-Lys-Thr (SEQ ID NO:9).